

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Customer No.: 38107

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

February 16, 2007

APPEAL BRIEF

Dear Sir:

Attached herewith are a Notice of Appeal and an Appeal Brief, pursuant to 35 U.S.C. §134 and 37 C.F.R. §41.37, in support thereof for the above-identified patent application.

CERTIFICATE OF ELECTRONIC TRANSMISSION

I certify that this Appeal Brief and Notice of Appeal are being filed on the date indicated below by electronic transmission with the United States Patent and Trademark Office via the electronic filing system (EFS-Web).

February 26, 2007

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I. REAL PARTY IN INTEREST

The real party in interest in the above-entitled application is Koninklijke Philips Electronics N.V., Eindhoven, NL.

II. RELATED APPEALS AND INTERFERENCES

The undersigned attorney/agent, the appellants, and the assignee are not aware of any related appeals or interferences that would directly affect, or be directly affected by, or have a bearing on the Board's decision in this pending appeal.

III. STATUS OF THE CLAIMS

The Office has rejected claims 1-20. Claim 7 has been cancelled. Claims 1-6 and 8-20 are all on appeal.

IV. STATUS OF AMENDMENTS

No after final amendments have been submitted.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Independent claim 1 is directed towards a method of visualizing an internal hollow organ of a subject based on a volumetric scan thereof. (Page 4, line 30 to page 5, line 11). The method includes reconstructing a number of three-dimensional images of the internal surface of the hollow organ of a subject. (Page 5, line 16 to page 6, line 24). For each image, the method includes calculating an image for the left eye from a first view point (Page 7, lines 25-27) and an image for the right eye from a second view point that differs from the first view point (Page 7, lines 28-33). The first and the second view points each have view directions that are essentially parallel to each other. (Page 8, lines 1-2). For each image, the method further includes combining the left eye image and the right eye image into a pair to form a stereoscopic image.

(Page 8, line 13 to page 9, line 15). The stereoscopic image is shown using stereoscopic imager means. (Page 9, line 14 to page 10, line 13).

Dependent claim 2, which depends from independent claim 1, recites that the method of claim 1 further includes defining a view path through the hollow organ (Page 7, lines 4-5 and lines 18-19) and reconstructing the images as seen from view points lying on the view path (Page 7, 15-17), wherein one of the first and the second view points lies on the view path (Page 8, line 27 to page 9, line 3).

Independent claim 13 is directed towards a system for visualizing an internal hollow organ of a subject based on a volumetric scan thereof. (Page 10, lines 16-17). The system includes a means for reconstructing a number of three-dimensional images of the internal surface of the hollow organ, means for calculating an image for the left eye from a first view point having a first direction, means for calculating an image for the right eye from a second view point that differs from the first view point and that has a second direction, which is essentially parallel to the first direction of the first view point, means for combining the left eye image and the right eye image into a pair to form a stereoscopic image, and means for showing the stereoscopic image using stereoscopic imager means. (Page 10, lines 16-19).

Independent claim 14 is directed towards readable media comprising a program to carry out the method a system for visualizing an internal hollow organ of a subject based on a volumetric scan thereof. (Page 10, lines 19-21). The method includes reconstructing a number of three-dimensional images of the internal surface of the hollow organ. (Page 5, line 16 to page 6, line 24). For each image, the method includes calculating an image for the left eye from a first view point (Page 7, lines 25-27) and an image for the right eye from a second view point that differs from the first view point (Page 7, lines 28-33). The first and the second view points each have view directions that are essentially parallel to each other. (Page 8, lines 1-2). For each image, the method further includes combining the left eye image and the right eye image into a pair to form a stereoscopic image. (Page 8, line 13 to page 9, line 15). The stereoscopic image is shown using stereoscopic imager means. (Page 9, line 14 to page 10, line 13).

Claims 17, 18, and 19 (which depend from claim 13) respectively recite further including means for generating the images as seen from one of the first and the second view points, which viewpoint resides on a view path, means for generating the images as seen from both the first and

the second view points, both of which reside on a view path, and means for generating the images wherein for each image the first view point resides on a first view line and the second view point resides on a second view line and the first and second view lines extend essentially parallel to each other. (Page 10, lines 16-19).

VI. GROUND'S OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-3, 5, 13-15, and 17-20 are unpatentable under 35 U.S.C. 103(a) over Shimizu (US 5,953,013) in view of Kaji (US 6,501,468).

Whether claim 4 is unpatentable under 35 U.S.C. 103(a) over Shimizu in view of Kaji and in further view of Lorensen et al. (US 5,611,025).

Whether claim 6 is unpatentable under 35 U.S.C. 103(a) over Shimizu in view of Kaji and in further view of Orgino (US 6,762,794).

Whether claims 8 and 9 are unpatentable under 35 U.S.C. 103(a) over Shimizu in view of Kaji and in further view of Palm (US 5,748,199).

Whether claims 10 and 11 are unpatentable under 35 U.S.C. 103(a) over Shimizu in view of Kaji in further view of Palm and in further view of Chiu (US 5,606,348).

Whether claim 12 is unpatentable under 35 U.S.C. 103(a) over Shimizu in view of Kaji and in further view of Chiu.

Whether claim 16 is unpatentable under 35 U.S.C. 103(a) over Shimizu in view of Kaji and in further view of Holbrook ("Three-Dimensional Stereographic Visual Displays Marketing and Consumer Research").

VII. ARGUMENTS

A. The Rejection of Claims 1-3, 5, 13-15, and 17-20 under 35 U.S.C. 103(a) over Shimizu (US 5,953,013) and in view of Kaji (US 6,501,468).

Claims 1-3, 5, 13-15, and 17-20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu and in view of Kaji.

Claims 1, 13, and 14.

The rejection of independent claims 1, 13, and 14 should be withdrawn because the Office has failed to show the requisite suggestion or motivation to establish a *prima facie* case of obviousness.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings....

See MPEP §2143

Independent claims 1, 13, and 14 are directed towards visualizing an internal hollow organ of a subject based on a volumetric scan thereof. These claims recite, *inter alia*, reconstructing three-dimensional images of an internal surface of the hollow organ and calculating an image for the left and the right eyes respectively from first and second view points that have view directions that are essentially parallel to each other.

Shimizu teaches a method of constructing a three-dimensional image according to a central projection technique. (See Abstract). Shimizu discloses using this technique to construct a three-dimensional image representative of the inside of a organ observed with an endoscope, which is a small camera that is inserted within an organ and near internal surfaces thereof in order to view the interior surfaces of the organ. More particularly, Shimizu teaches using an eye-ball transformation technique to stereoscopically observe the three-dimensional images of the internal surface with left and right view points that are directed towards a common spherical surface disposed therebetween. (See col. 16, ll. 30-33, col. 12, ll. 23-33, and Figure 11). As a consequence, the view directions of the left and right view points eL and eR *meet and crisscross* at the sphere and, thus, are not essentially parallel to each other. (See Figure 11). The Office concedes that Shimizu does not teach or suggest left and right view points having view directions that are essentially parallel to each other.

To remedy this conceded deficiency of Shimizu, the Office references Kaji, which is directed towards a head mount display 1 having a main body 2 that executes games and other programs recorded in ROM 12 and generates computer graphic images that are displayed to a user via a goggle-shaped monitor 4 disposed before the user's eyes. (See column 3, lines 10-21).

The Office asserts that Kaju teaches left and right view points that are essentially parallel to each other and that it would have been obvious to one of ordinary skill in the relevant art at the time of the invention to combine the teachings of these references to teach applicant's claimed invention. The Office asserts that this combination is obvious because it would provide stereoscopic imagery in which the view directions of the left and right eyes may be set parallel in order to present a more accurate and precise stereoscopic image to the user through a head mounted display. The Office references column 1, lines 56-62, and Figure 6 of Kaji to support this assertion.

However, column 1, lines 56-62, and Figure 6 of Kaji do not support this assertion. Column 1, lines 56-62, of Kaji states that an object of the present invention is to provide a stereoscopic display device that generates natural images, similar to images as a human being actually sees, utilizing parallax with both eyes. Hence, Kaji desires to stereoscopically present an image so that the objects in the image appear natural to a human. The description of Figure 6 discloses that using parallel lines of sight (as depicted in Figure 6) creates an unnatural feeling for human perception or a sense of incongruity when looking at an object in close proximity and not at infinity. (See column 3, line 63 to column 4, line 3). Thus, Kaji teaches that using parallel lines of sight results in an image in which an object in close proximity to the viewer appears unnatural to a human. As a consequence, Kaji also uses lines of sight that meet (and, thus, are not parallel) at the same point on a view path when generating an image to provide a natural appearance. (See FIG. 3, and column 6, lines 1-5).

Since both Shimizu and Kaji teach using non-parallel view directions to generate an image of objects in close proximity and Kaji states that using parallel view directions for such objects results in an unnatural feeling for human perception, there is no suggestion or motivation in the references or the general knowledge available to one skilled in the relevant art to be modify Shimizu in view of Kaji as purported by the Office to teach the subject claim. Therefore, a *prima facie* case of obvious has not been established. MPEP §2143.01 *citing In re Rouffet*, 149 F.3d 1350 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a *prima facie* case of obvious was held improper.).

In fact, the teachings of Kaji teach away from such a modification to Shimizu since Kaji explicitly states that using parallel view directions for objects in close proximity (e.g., Shimizu's image representative of the inside of an organ as observed with an endoscope) results in an unnatural appearance to a human, and both Shimizu and Kaji teach use of non-parallel view directions. The Office is reminded that it is improper to combine references where the references teach away from their combination. MPEP §2145 (X) (D) *citing In re Grasselli*, 713 F.2d 731, (Fed. Cir. 1983).

It is also noted that applicants' representative presented arguments in response to the Office Action dated 7/17/06 and the final Office Action dated 11/24/06 regarding the references teaching away from the purported modification/combination. The Office did not address these argument even though "prior art must be considered in its entirety, including disclosures the teach away from the claims." MPEP §2142.02. Rather, the Office has responded only by stating that Kkaji teaches parallel view directions in Figure 6 without any comment rebutting the fact that the references teach away from such modification to Shimizu.

In view of the above, the rejection of claims 1, 13, and 14 should be withdrawn.

Claim 2.

Claim 2, which depends from claim 1, recites that the method of claim 1 further includes, *inter alia*, reconstructing an image in which one of two essentially parallel view points is on the view path. Hence, claim 2 recites providing a stereoscopic view of an image from left and right essentially parallel view points in which one of the essentially parallel view points is on the view path and the other of the essentially parallel view point is not. The Office asserts that Shimizu teaches this claimed aspect. Applicant respectfully disagrees.

Instead, Shimizu discloses providing a monoscopic view of an image from a single view point on a view line, wherein the view point is stepped along the view line. With this configuration, the view point always lies on the view line. Shimizu also discloses providing a stereoscopic view of an image from two view points that are both shifted off of a view line. With this configuration, neither view point lies on the view line. Therefore, Shimizu teaches placing either all of the view points or none of the view points on the view line. However,

Shimizu does not teach or suggest placing one of two essentially parallel view points on a view line as recited in the subject claim. Therefore, Shimizu does not teach this claimed aspect.

Accordingly, the rejection of claim 2 should be withdrawn.

Claims 3, 5, 15, and 17-20

Claims 3, 5, 15, and 17-20 depend from independent claims 1, 13, or 14, and, by virtue of their dependency, are allowable for at least the reasons discussed above.

B. The Rejection of claim 4 under 35 U.S.C. 103(a) over Shimizu in view of Kaji and in further view of Lorenson et al. (US 5,611,025).

Claim 4 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Kaji and in further view of Lorenson et al. Claim 4 depends from claim 1, and by virtue of this dependency, claim 4 is allowable for at least the reasons discussed above in connection with claim 1.

C. The Rejection of claim 6 under 35 U.S.C. 103(a) over Shimizu in view of Kaji and in further view of Orgino (US 6,762,794).

Claim 6 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Kaji and in further view of Orgino. Claim 6 depends from claim 1, and by virtue of this dependency is allowable.

D. The Rejection of claims 8-9 under 35 U.S.C. 103(a) over Shimizu in view of Kaji and in further view of Palm (US 5,748,199).

Claims 8 and 9 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Kaji and in further view of Palm. These claims depend from claim 1 and, by virtue of their dependency, are allowable for the above discussed reasons.

E. The Rejection of claims 10-11 under 35 U.S.C. 103(a) over Shimizu in view of Kaji in further view of Palm and in further view of Chiu (US 5,606,348).

Claims 10 and 11 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Kaji in further view of Palm and in further view of Chiu. Claims 10 and 11 depend from claim 1, and, by virtue of their dependency, these claims are allowable for at least the above discussed reasons.

F. The Rejection of claim 12 under 35 U.S.C. 103(a) over Shimizu in view of Kaji and in further view of Chiu.

Claim 12 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Kaji and in further view of Chiu. Claim 12 depends from claim 1, and, by virtue of this dependency, claim 12 is allowable for at least the reasons discussed above in connection with claim 1.

G. The Rejection of claim 16 under 35 U.S.C. 103(a) over Shimizu in view of Hollbrook ("Three-Dimensional Stereographic Visual Displays Marketing and Consumer Research").

Claim 16 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Hollbrook. Claim 16 depends from claim 1 and is allowable by virtue of this dependency.

VIII. CONCLUSION

In view of the foregoing, it is submitted that all pending claims distinguish patentably and non-obviously over the prior art of record, and reversal of the rejection of the claims is respectfully requested.

Respectfully submitted,

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IX. CLAIM APPENDIX

1. A method of visualising an internal hollow organ of a subject based on a volumetric scan thereof, said method comprising the step of:
 - a) Reconstructing a number of three-dimensional images of the internal surface of the hollow organ; wherein for each image the method comprises the steps of:
 - b) Calculating an image for the left eye from a first view point;
 - c) Calculating an image for the right eye from a second view point that differs from the first view point, wherein the first and the second view points each have view directions that are essentially parallel to each other;
 - d) Combining the left eye image and the right eye image into a pair to form a stereoscopic image; and
 - e) Showing the stereoscopic image using stereoscopic imager means.
2. The method according to claim 1, wherein step a) further comprises the steps of:
 - I. Defining a view path through the hollow organ; and
 - II. Reconstructing the images as seen from view points lying on the view path, wherein one of the first and the second view point lies on the view path.
3. The method according to claim 1, wherein step a) further comprises the steps of:
 - I. Defining a view path through the hollow organ; and
 - II. Reconstructing the images as seen from view points lying on the view path, wherein both the first and second view point lie on the view path.
4. The method according to claim 3, wherein view points on the view path are alternately used as first or second view point.
5. The method according to claim 1, wherein step a) further comprises the steps of:
 - I. Defining a view path through the hollow organ, wherein for each image the first view point lies on a first line and the second view point lies on a second line, which first and second lines extend essentially parallel to the view path at a certain mutual distance.

6. The method according to claim 1, wherein the distance between the first and the second viewpoint is at least one millimeter.
7. Cancelled
8. The method according to claim 1, wherein step e) further comprises the steps of:
- I. Showing the left and right eye image forming a stereoscopic image with different modification; and
 - II. Arranging the stereoscopic imager means such that the left eye image is passed to the left eye and the right eye image is passed to the right eye.
9. The method according to claim 8, wherein step I comprises the step of:
Alternately showing the left and right eye image of a stereoscopic image with different polarization; and wherein step II comprises the step of:
Providing the stereoscopic imager means with correspondingly differently polarized viewing means for respectively the left and right eye.
10. The method according to claim 8, wherein step I comprises the step of:
Showing the left and right eye image of a stereoscopic image with different time-multiplexation, and wherein step II comprises the step of:
Providing the stereoscopic imager means with different viewing means for the left and right eye that are to be activated separately by a control unit based on corresponding time-multiplexation signals.
11. The method according to claim 9, wherein the viewing means is incorporated in a head-mountable display.
12. The method according to claim 1, wherein the stereoscopic imager means comprises a lenticular screen.

13. A system for visualizing an internal hollow organ of a subject based on a volumetric scan thereof, which system comprises:

a) means for reconstructing a number of three-dimensional images of the internal surface of the hollow organ;

characterised in that for each image the method comprises the steps of:

b) means for calculating an image for the left eye from a first view point having a first direction;

c) means for calculating an image for the right eye from a second view point that differs from the first view point and that has a second direction, which is essentially parallel to the first direction of the first view point;

d) means for combining the left eye image and the right eye image into a pair to form a stereoscopic image; and

e) means for showing the stereoscopic image using stereoscopic imager means.

14. A computer readable media comprising a program to carry out the method according to claim 1.

15. The method according to claim 10, wherein the viewing means is incorporated in a head-mountable display.

16. The method according to claim 1, wherein the distance between the first and the second view points is about 1/30 of a distance from the first and second view points to a surface within the internal hollow organ.

17. The method according to claim 13, further comprising:
means for generating the images as seen from one of the first and the second view points, which viewpoint resides on a view path.

18. The method according to claim 13, further comprising:
means for generating the images as seen from both the first and the second view points, both of which reside on a view path.

19. The method according to claim 13, further comprising:
means for generating the images wherein for each image the first view point resides on a first view line and the second view point resides on a second view line and the first and second view lines extend essentially parallel to each other.

20. The method according to claim 19, wherein the first and second view lines extend essentially parallel to a view path.

X. EVIDENCE APPENDIX

None.

XI. RELATED PROCEEDINGS APPENDIX

None known to undersigned attorney/agent.